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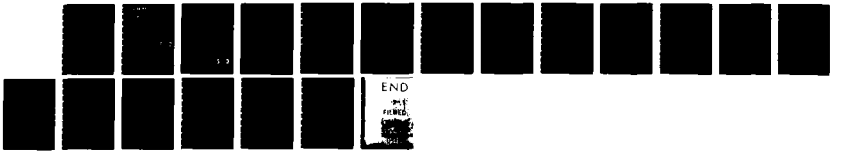

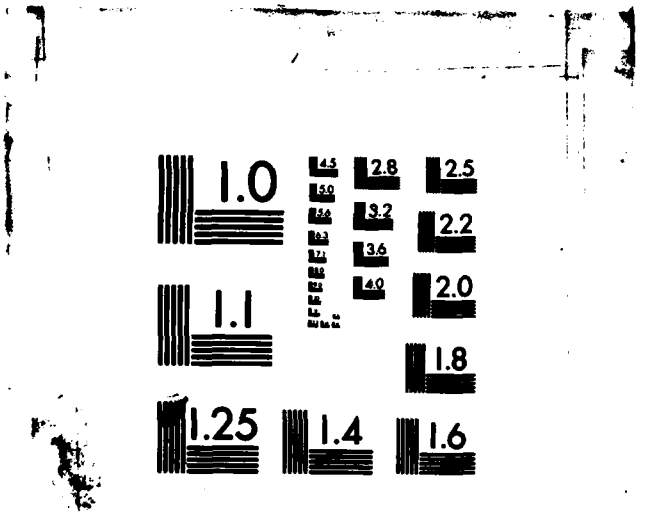

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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HEALTH EFFECTS ASSOCIATED WITH MINORITY STATUS AMONG U.S. NAVY OFFICERS

A. HOIBERG

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NAVAL HEALTH RESEARCH CENTER
P. O. BOX 85122
SAN DIEGO, CALIFORNIA 92138

NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND
BETHESDA, MARYLAND

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Anne Hoiberg

Naval Health Research Center

P. O. Box 85122

San Diego, CA 92138-9174

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SUMMARY

Problem

The Navy is a dynamic organization that has changed over the decade from an almost exclusively male Caucasian population to one comprised of increasing numbers of minorities. Each minority group brings to the Navy a unique set of health problems and health care needs that should be recognized and met by the Navy's medical department.

Objective

The objectives of this study were (1) to identify the health risks unique to various minority groups in the Navy Officer Corps and (2) to determine whether or not being a member of a minority group had an impact on the individual's health, as reflected by an elevated hospitalization rate, especially for stress-related disorders. Physical Evaluation Board incidence and disability rates as well as attrition rates and death data also were examined across subpopulations.

Approach

Using the officer career history file and the medical inpatient file, five subpopulations of Navy officers who served for any time period from July 1967 through December 1979 were identified: male Caucasians (n = 133,818), male blacks (n = 1,486), unrestricted line officers (n = 46,189 men; n = 3,149 women), Nurse Corps (n = 1,156 men; n = 7,410 women), and other officers of the Staff Corps (n = 45,409 men; n = 1,132 women). The numbers of hospital admissions for each specific diagnosis were tallied for the five subpopulations, and hospitalization rates per 10,000 strength were computed for total hospitalizations, major diagnostic categories, and several selected diagnoses. Similarly, rates per 10,000 were derived for Physical Evaluation Board actions; percentages of losses for various reasons also were computed. The χ^2 technique was used to ascertain the statistical significance of differences between officer groups for hospitalizations and Physical Evaluation Board actions.

Results

Results of this study identified several specific health problems unique to each of the selected minority groups in the Navy Officer Corps. One of the most significant health problems differentiating black officers from Caucasians was the subcategory of hereditary hemolytic anemias which clearly implicated genetic predisposition as the contributing factor. Blacks also had significantly higher hospitalization rates than Caucasians for diabetes mellitus, hypertension, and psychoses; the incidence of these disorders has been shown to be associated with genetic predisposition and job-related stress. Hospitalization rates for redundant prepuce and phimosis and strains, sprains, and dislocations also were significantly higher for black officers than their Caucasian counterparts.

Results of the occupational comparisons of hospitalization rates by sex identified male nurses as having the highest overall rate of all groups. Women in each of the three occupational groups had significantly higher hospitalization rates than men for genitourinary diseases, supplementary classifications, and neoplasms; also noted was the sizable proportion of women's total rate for pregnancy-related conditions. The large observed differences in rates, therefore, were attributable to pregnancy-related conditions and disorders unique to women's complex reproductive system. Men in each of the three occupational groups had significantly higher hospitalization rates than women for circulatory diseases which supported the hypothesis that men have higher rates than women for chronic and serious conditions.

Male nurses had significantly higher hospitalization rates than female nurses for the vast majority of diagnoses but especially for digestive disorders, respiratory diseases, infective and parasitic diseases, accidental injuries, mental disorders, and circulatory diseases. Of the 11 stress-related disorders, the only significant differences between male and female nurses were men's higher rates for ulcers and hypertension. Women unrestricted line officers had significantly higher hospitalization rates than their male counterparts for almost all major diagnostic categories as well as neuroses, abdominal and gastrointestinal symptoms, diarrheal disease, and transient situational disturbances. For women Staff Corps officers, rates for the categories of metabolic diseases, mental disorders, respiratory diseases, and infective and parasitic diseases as well as the subcategories of neuroses, diabetes mellitus, and transient situational distrubances were significantly higher than those for men.

Comparisons of Physical Evaluation Board actions revealed that blacks and women had higher rates than Caucasians for mental disorders. Caucasians had the highest proportion of officers who retired from active duty after 20 years.

Conclusions

The implications of this study were as follows. (1) The Navy's medical department should be apprised of the health care needs unique to each minority group in the organization. (2) Each minority group studied was shown to have significantly higher rates than dominants for one or more of the stress-related disorders, with women unrestricted line officers having more significant differences than other groups. Perhaps an increment in the proportion of women unrestricted line officers would result in a lowering of their stress-related illness rates. (3) Male Caucasian officers had significantly higher rates of circulatory disease than women. Prevention and intervention programs should be implemented in an effort to reduce these rates. (4) These findings pointed to the need to conduct correlational analyses to determine the extent of the relationship between minority status and illness incidence.

Health Effects Associated with Minority Status among U. S. Navy Officers

The Navy is a dynamic organization that has changed in composition over the past decade from an almost exclusively male Caucasian population to one comprised of increasing numbers of minorities. In March 1982, the Naval Military Personnel Command reported that racial/ethnic minorities accounted for 15.6% of the total enlisted male population: 11.3% blacks, 3.0% Hispanics, 0.7% American Indians, and 0.6% Asian-Americans. These proportions reflect a doubling of minority representation since 1972. Filipino nationals comprise a small but stable proportion of the total enlisted force (4.2%) which over the years has remained at that percentage because of a post-World War II quota agreement between the United States and Philippine governments. The proportion of female enlisted personnel also has increased during the 1972 to 1982 decade, from 1.5% to 7.8%. Among male officers, on the other hand, the percentages of minority group members have shown minimal changes during the past decade. Male Caucasians accounted for 97% of the total in 1972 and 95% in 1982 while the percentage of male black officers gradually increased from 1% to 3%. The proportion of women officers rose from 4.4% in 1972 to 8.3% in 1982.

Each of these groups brings to the Navy a unique set of health problems and health care needs that should be recognized and met by the Navy's Medical Department. Research on Navy enlisted men (Hoiberg et al., 1981) has shown that blacks have the highest total hospitalization rate, followed by Caucasians, American Indians, Asian-Americans, and Malaysians/Mongolians (primarily Filipino nationals). Specific findings of that study reveal considerable variability in hospitalization rates among these enlisted groups for infectious diseases, accidental injuries, chronic diseases, and mental disorders. Explanations proffered by those authors for the marked differences in rates across groups center primarily on occupational experience, although age, selection, availability of free health care, and genetics also were examined as contributing factors.

The most common medical problems of Navy enlisted women are those related to pregnancy and the genitourinary system (Hoiberg, 1980, 1984). While enlisted women's overall hospitalization rates tend to be more than double those of men, at least one-third of their overall rate is accounted for by pregnancy-related and genitourinary conditions (Hoiberg, 1980). In fact, their hospitalization rate for genitourinary disorders is observed to be as much as six times higher than their male counterparts which also corresponds with findings reported for the civilian community (Verbrugge, 1976). In addition to these biologically related differences, other results show that Navy enlisted women have higher hospitalization rates than men for several acute disorders including transient situational disturbances, diarrheal disease, and symptoms referable to the abdomen and gastrointestinal tract. Similarly, Verbrugge (1976) reports that women's excess in total morbidity occurs primarily in milder forms of illness and injury as contrasted with men's higher rates for the chronic conditions of hypertension, other cerebrovascular disease, and cardiovascular disease. Hypotheses formulated by several researchers to explain these sex differences in morbidity rates include: (1) biological differences in that women have greater resistance to chronic diseases through the protection of estrogen (Verbrugge, 1976); (2) women's excess role demands or their numerous nurturant role obligations which might increase exposure to various acute diseases and/or interfere with their ability to care for themselves (Gove and Hughes, 1979; Marcus and Seeman, 1981); (3) cultural considerations in that women's traditional roles make it easier and more socially acceptable for them to adopt the sick role (Nathanson, 1975; Verbrugge, 1976); (4) social differences that are associated with women's purportedly more flexible time and work con-

straints (Nathanson, 1975; Verbrugge, 1976); and (5) social stress in that women are more stressed than men which could result in their higher morbidity rate (Nathanson, 1975; Verbrugge, 1976). According to Marcus and Seeman (1981), however, none of these hypotheses has been adequately tested to date.

Not to be ignored as a possible social stressor, which would be common to the Navy and other military branches, is the impact on health of being a minority member in a predominantly white male organization. Kanter's research (1977a, 1977b) concludes that in groups where the ratio of dominants to minorities is more than 85:15 (such as exists in the Navy Officer Corps) the behavior of members of both groups is affected by the numerous difficulties associated with integration. The basis for her conclusion is that minorities, which Kanter has labeled as "tokens" in skewed groups, must deal with high visibility, polarization, and assimilation. "Visibility generates performance pressures, polarization leads dominants to heighten their group boundaries, and assimilation leads to the tokens' role entrapment" (1977a). Even if the number of minority members in a group exceeds 15% and they are no longer "tokens," the process of integration then might involve a different form of resistance. The presence of more women, for example, could elicit resentment among men concerning the additional competition for future career advancement opportunities. Addressing and overcoming these barriers to satisfactory integration, in addition to meeting productivity and training requirements, might affect a minority member's emotional state (anger and depression) which then could be internalized and result in an increase in stress-related disorders. Few research studies, however, have examined the ill health effects attributable to the stress generated in a skewed organization.

The first objective of this study was to identify the health risks unique to various minority groups in the Navy Officer Corps, as contrasted with the aforementioned research reported on enlisted personnel. The second objective determined whether or not being a member of a minority group in a predominantly male Caucasian organization had an impact on the individual's health which would be reflected by an elevated hospitalization rate, especially for stress-related disorders. Also to be examined was the effect on health of being a male minority member in a work environment where women numerically are dominant (e.g., Navy Nurse Corps). For the purpose of this study, stress-related disorders included cardiovascular disease, hypertension, other cerebrovascular disease, ulcers, diabetes mellitus, alcohol abuse, psychoses, neuroses, transient situational disturbances, diarrheal disease, and abdominal and gastrointestinal symptoms (Hoiberg, 1982). The groups to be compared were the following: (1) male Caucasian and black officers and (2) women and men by officer occupational designator (unrestricted line, Staff Corps, and Nurse Corps). Disability discharge rates as well as attrition rates and death data also were examined to determine if there were differences in overall loss rates across the three subpopulations of male Caucasian officers, male black officers, and female officers.

METHODOLOGY

Participants

The naval officer population for this study consisted of five subpopulations of individuals who had served on active duty for any period of time from July 1967 through December 1979. The two male officer subpopulations for the racial group comparisons included Caucasians (n = 133,818) and blacks (n = 1,486). For the occupational comparisons by sex, the population was comprised of unrestricted line officers (n = 46,189 men; n = 3,149 women); Nurse Corps (n = 1,156 men; n = 7,410 women); and other officers of the Staff Corps, which included physicians, lawyers, engineers, chaplains, etc. (n = 45,409 men; n = 1,132 women).

Procedure

Data for this study were obtained from the officer career history and medical inpatient historical files, both of which are maintained at the Naval Health Research Center. Each of the five subpopulations studied was selected, using the variables of sex, race, and occupational designator, from the officer career history file which consists of all officers who served on active duty for any time period during the 12.5 years of this study. Specific data extracted from this file included date of commission as well as date of and reason for resignation, separation, or retirement from active duty. Information on hospitalizations and Physical Evaluation Board actions, including primary diagnoses, date of each incident, and disposition after the board appearance, were obtained from the medical inpatient historical file. A Physical Evaluation Board determines whether or not an individual should remain in the Navy or be separated for medical reasons, the extent of disability incurred, and the compensation awarded. Diagnostic codes used for the hospital and Physical Evaluation Boards records were from the Eighth Revision of the International Classification of Diseases Adapted for Use in the United States (ICDA-8).

To compute hospitalization rates per 10,000 strength, populations at risk were determined by tabulating the number of individuals on active duty by year for the July 1967 through December 1979 time period and averaging the values across the 12.5 years. Using the number of hospitalizations in the numerator and the mean population at risk in the denominator for each of the subpopulations, hospitalization rates per 10,000 strength were computed for total hospital admissions, the major diagnostic categories, and several selected diagnoses. Similarly, rates per 10,000 were derived for Physical Evaluation Board actions; percentages of losses for various reasons also were calculated for each of the subpopulations. It should be noted that rates for both hospital admissions and Physical Evaluation Board actions were not age-adjusted, primarily because of the relatively small populations at risk for each minority group and the few cases reported for many diagnoses. Differences in birth years, however, were minimal with the narrowest range observed between male and female nurses and the widest between male and female unrestricted line officers. Overall, the age distribution of the officer population changed during the early to mid 1970s as increasingly more senior officers were retired. Computations of relative risks of being hospitalized enabled comparisons between the subpopulations of blacks and Caucasians, female and male unrestricted line officers, female and male Staff Corps officers, and male and female Nurse Corps officers. The procedure for computing these odds ratios involved the division of the minority group's hospitalization rate by that of the dominant group. The chi square technique was used to determine the level of statistical significance in differentiating between two subpopulations being compared on hospitalizations or Physical Evaluation Boards.

RESULTS

Comparisons of Hospitalization Rates between Racial Groups

Table 1 is a presentation of hospitalization rates per 10,000 strength for total admissions, 16 major diagnostic categories, and selected diagnoses as well as relative risks and chi square values for black officers when compared with Caucasians. The total admission rate was 466.7 for blacks and 303.8 for Caucasians which resulted in a significant χ^2 value of 24.3 ($p < .001$). Other results shown in Table 1 indicated that blacks had significantly higher rates for the categories of Diseases of the Genitourinary System; Diseases of the Blood and Blood-forming Organs; Endocrine, Nutritional, and Metabolic Diseases; Accidents, Poisonings, and Violence; and Supplementary Classifications. Specific diseases and disorders that

TABLE 1. ANNUAL HOSPITALIZATION RATES AND RELATIVE RISKS FOR NAVY MALE OFFICERS RANK ORDERED BY MAJOR DISEASE CATEGORIES, SELECTED DIAGNOSES, AND RACIAL GROUP, 1967-79

Diagnostic Category (ICDA-8)	Caucasian Rate[a]	Black Rate	Black/ Caucasian RR[b]	χ^2
Diseases of the Digestive System	60.6	67.5	1.11	0.24
Inguinal Hernias	17.1	10.0	0.59	5.73
Ali Ulcers	2.7	2.9	1.07	0.03
Accidents, Poisonings, and Violence	44.4	76.1	1.71	6.98
Fractures	13.4	23.0	1.71	2.05
Strains, Sprains, and Dislocations	14.8	31.6	2.13	7.48
Wounds, Injuries, Contusions	11.5	15.8	1.37	0.20
Diseases of the Musculoskeletal System and Connective Tissue	30.7	44.5	1.45	1.14
Other Diseases of the Joint	3.1	5.7	1.88	0.81
Diseases of the Respiratory System	26.5	24.4	0.92	1.18
Pneumonias	5.1	4.3	0.84	0.38
Other Diseases of the Upper Respiratory Tract	3.4	1.4	0.42	1.20
Diseases of the Genitourinary System	21.4	76.1	3.56	67.96
Redundant Prepuce and Phimosis	2.1	45.9	21.88	434.18
Infective and Parasitic Diseases	19.7	31.6	1.60	1.87
Diarrheal Disease	4.5	8.6	1.93	1.38
Viral Hepatitis	3.1	7.2	2.29	2.15
Diseases of the Circulatory System	19.9	15.8	0.79	1.88
Hypertension	1.8	7.2	4.08	8.22
Other Cerebrovascular Disease	0.7	1.4	2.00	0.26
Cardiovascular Disease	8.6	2.9	0.33	3.74
Mental Disorders	16.4	24.4	1.49	0.83
Psychoses	1.6	8.6	5.22	14.82
Neuroses	2.8	2.9	1.03	0.04
Alcohol Abuse	7.3	5.7	0.76	0.82
Transient Situational Disturbances	2.0	2.9	1.40	0.05
Symptoms and Ill-defined Conditions	15.0	23.0	1.54	1.00
Abdominal and Gastrointestinal Symptoms	2.7	4.3	1.80	0.22
Diseases of the Skin and Subcutaneous Tissue	12.2	14.4	1.18	0.00
Neoplasms	11.6	12.9	1.12	0.04
Diseases of the Nervous System and Sense Organs	10.3	11.5	1.11	0.04
Supplementary Classifications	7.6	18.7	2.44	6.76
Endocrine, Nutritional, and Metabolic Diseases	3.3	11.5	3.48	9.70
Diabetes Mellitus	1.0	8.6	9.06	31.78
Congenital Anomalies	3.2	4.3	1.34	0.04
Diseases of the Blood and Blood-Forming Organs	1.0	10.0	10.36	43.13
Hereditary Hemolytic Anemias	0.1	8.6	66.23	195.21
Total Hospitalization Rate	303.8	466.7	1.54	34.27
Mean Population at Risk	60,049	557		

$\chi^2 = 3.84$, $p < .05$; $\chi^2 = 6.64$, $p < .01$; $\chi^2 = 10.83$, $p < .001$.

[a] Annual hospitalization rates are per 10,000 strength for men officers.

[b] Relative risks (RR) are the ratios of rates of black to Caucasian officers. These values were computed using rates extended to two decimal places.

TABLE 2. ANNUAL HOSPITALIZATION RATES FOR NAVY FEMALE OFFICERS AND RELATIVE RISKS (MINORITY/MAJORITY RATIOS) RANK ORDERED BY MAJOR DISEASE CATEGORIES, SELECTED DIAGNOSES, AND OCCUPATION, 1967-79

	Occupation								
	Unrestricted Line			Staff Corps			Nurse Corps		
Diagnostic Category (ICDA-8)	Rate[a]	F/M RR[b]	χ^2	Rate	F/M RR	χ^2	Rate	M/F RR	χ^2
Diseases of the Genitourinary System	100.2	5.51	171.02	52.2	2.31	29.40	156.8	0.86	3.91
Disorders of Menstruation	23.9	-		18.7	-		49.2	-	
Pregnancy-related Conditions	166.4	-		100.4	-		115.3	-	
Abortions	44.1	-		22.8	-		29.0	-	
Deliveries	104.8	-		81.6	-		67.4	-	
Diseases of the Respiratory System	57.0	2.53	15.64	46.8	1.63	9.15	125.0	2.04	36.16
Pneumonias	8.3	1.97	0.59	9.4	1.37	0.79	26.1	2.14	8.73
Diseases of the Digestive System	36.8	0.59	37.87	45.5	0.99	0.00	110.6	2.26	47.96
All Ulcers	0	-	-	0	-	-	5.0	3.99	10.87
Infective and Parasitic Diseases	47.8	3.05	24.03	33.5	1.60	6.10	106.1	2.08	33.39
Diarrheal Disease	13.8	4.72	18.08	9.4	2.02	3.67	33.4	1.41	1.02
Diseases of the Musculoskeletal System and Connective Tissue	55.2	2.08	5.97	37.5	1.25	1.69	101.7	1.16	0.12
Accidents, Poisonings, and Violence	58.8	1.44	0.10	24.1	0.74	1.46	99.8	1.77	14.82
Fractures	16.6	1.36	0.17	4.0	0.40	2.57	15.1	1.48	0.70
Strains, Sprains, and Dislocations	16.6	1.22	0.76	6.7	0.59	1.32	41.3	1.90	8.35
Wounds, Injuries, and Contusions	19.3	1.81	0.67	4.0	0.53	1.17	25.2	2.13	8.28
Neoplasms	48.7	3.85	43.11	32.1	3.48	40.95	69.3	0.42	12.86
Symptoms and Ill-defined Conditions	39.5	2.97	18.43	20.1	1.32	1.45	70.9	1.01	0.25
Abdominal and Gastrointestinal Symptoms	16.6	7.63	43.84	-	-	-	20.8	1.08	0.01
Mental Disorders	55.2	3.76	46.53	37.5	1.97	13.91	57.0	1.76	8.19
Psychoses	4.6	3.56	3.39	0	-	-	4.1	0.55	0.48
Neuroses	20.2	7.96	56.34	14.7	4.58	28.69	14.5	1.54	0.92
Alcohol Abuse	12.0	2.25	1.98	14.7	1.66	3.08	17.3	1.94	3.80
Transient Situational Disturbances	10.1	3.62	7.79	5.4	2.91	3.88	11.0	1.42	0.36
Diseases of the Nervous System and Sense Organs	12.0	1.29	0.28	13.4	1.25	0.60	52.6	1.28	0.52
Diseases of the Circulatory System	13.8	0.71	8.76	8.0	0.40	5.13	40.9	1.80	6.48
Hypertension	-	-	-	0	-	-	3.5	3.88	6.93
Other Cerebrovascular Disease	-	-	-	0	-	-	1.6	-	-
Cardiovascular Disease	2.8	0.31	8.92	5.4	0.70	0.48	7.2	1.85	1.29
Supplementary Classifications	40.5	5.61	70.41	32.1	4.98	70.39	22.7	0.80	0.84
Diseases of the Skin and Subcutaneous Tissue	17.5	1.37	0.16	1.3	0.14	5.14	34.0	1.51	1.88
Endocrine, Nutritional, and Metabolic Diseases	13.8	3.90	12.45	10.7	4.07	17.48	22.4	1.15	0.07
Diabetes Mellitus	3.7	3.40	2.42	4.0	5.57	10.26	2.8	2.37	1.37
Congenital Anomalies	9.2	3.62	7.06	4.0	1.21	0.14	19.2	1.05	0.02
Diseases of the Blood and Blood-forming Organs	5.5	6.00	10.61	0	-	-	6.6	1.69	0.74
Total Hospitalization Rate	777.9	2.75	336.14	499.2	1.80	166.50	1,210.9	1.34	48.50
Mean Population at Risk	870			598			2,540		

$\chi^2 = 3.84$, $p < .05$; $\chi^2 = 6.64$, $p < .01$; $\chi^2 = 10.83$, $p < .001$.

[a]Annual hospitalization rates are per 10,000 strength for women officers. Rates were not computed for diagnoses with frequencies less than three.

[b]Relative risks (RR) are the ratios of female to male rates for unrestricted line and Staff Corps officers and male to female rates for Nurse Corps Officers. These values were computed using rates extended to two decimal places.

differentiated blacks from Caucasians included: redundant prepuce and phimosis; hereditary hemolytic anemias; diabetes mellitus; psychoses; hypertension; and strains, sprains, and dislocations. In general, blacks were observed to have higher rates than Caucasians for nine of the 11 stress-related disorders; however, blacks' hospitalization rates were significantly higher only for diabetes mellitus, psychoses, and hypertension. Hospitalization rates for cardiovascular disease, on the other hand, were somewhat higher for Caucasians than blacks whereas Caucasian officers had significantly higher hospitalization rates for inguinal hernias.

Comparisons of Hospitalization Rates by Sex and Occupation

In comparing hospitalization rates by sex, as presented in Table 2, total admission rates for women in both unrestricted line and the Staff Corps were significantly higher than those for men whereas male nurses had a significantly higher rate than female nurses. Male nurses had the highest total rate across these officer subpopulations. Women unrestricted line officers had significantly higher hospitalization rates than men for the majority of diagnostic categories; the only exceptions were the significantly higher rates among men for Diseases of the Digestive System and Diseases of the Circulatory System. The largest differences in rates between women unrestricted line officers and their male counterparts were observed for the major diagnostic categories of Diseases of the Genitourinary System; Supplementary Classifications; Mental Disorders; Neoplasms; Infective and Parasitic Diseases; Symptoms and Ill-defined Conditions; and Diseases of the Respiratory System. Specific disorders with significantly higher rates for these women than men included neuroses, abdominal and gastrointestinal symptoms, diarrheal disease, and transient situational disturbances. By way of contrast, male unrestricted line officers had a significantly higher hospitalization rate than women for cardiovascular disease.

Hospitalization rates among women members of the Staff Corps were significantly higher than men's for the categories of Supplementary Classifications; Neoplasms; Diseases of the Genitourinary System; Endocrine, Nutritional, and Metabolic Diseases; Mental Disorders; Diseases of the Respiratory System; and Infective and Parasitic Diseases. Male Staff Corps officers had significantly higher hospitalization rates than women for Diseases of the Circulatory System and Diseases of the Skin and Subcutaneous Tissue. Significantly higher rates among women than men also were observed for the specific diagnoses of neuroses, diabetes mellitus, and transient situational disturbances.

In addition to having the highest hospitalization rates of all officer groups, male nurses had significantly higher hospitalization rates than women nurses for the categories of Diseases of the Digestive System; Diseases of the Respiratory System; Infective and Parasitic Diseases; Accidents, Poisonings, and Violence; Mental Disorders; and Diseases of the Circulatory System. Women nurses, on the other hand, had significantly higher rates than male nurses for the categories of Neoplasms and Diseases of the Genitourinary System. Of the specific diagnoses, male nurses had significantly higher rates than their female counterparts for ulcers, pneumonias, strains, wounds, and hypertension. None of the other specific diagnoses accounted for a significantly higher rate among either male or female nurses.

Comparisons of Physical Evaluation Board Actions and Loss Rates by Race and Sex

In comparisons of Physical Evaluation Board action rates per 10,000 strength, as shown in Table 3, the overall rate for women (52.9) was the highest of the three subpopulations. Women's rates were significantly higher than male Caucasian officers for the major diagnostic categories of Diseases of the Musculoskeletal System and Connective Tissue, Mental Disorders, and Neoplasms as well as for the specific diagnoses of

TABLE 3. ANNUAL PHYSICAL EVALUATION BOARD RATES FOR NAVY OFFICERS BY MAJOR DIAGNOSTIC CATEGORY, SEX, AND RACE (MEN ONLY), 1967-79

Diagnostic Category (ICDA-8)	Male Caucasian Rate[a]	Male Black Rate	Women Rate
Diseases of the Musculoskeletal System and Connective Tissue	6.4	5.7	13.8
Arthritis	2.3	0	2.6
Displacement of Intervertebral Disc	1.3	0	2.6
Diseases of the Joint	1.2	0	2.0
Diseases of the Circulatory System	6.1	-	4.8
Cardiovascular Disease	3.7	0	1.6
Diseases of the Nervous System and Sense Organs	3.1	0	5.2
Other Deafness	0.7	0	0
Mental Disorders	2.8	8.6	9.4
Psychoses	1.6	8.6	3.6
Neuroses	0.9	0	5.2
Neoplasms	2.3	0	5.8
Accidents, Poisonings, and Violence	2.3	2.9	1.8
Endocrine, Nutritional, and Metabolic Diseases	1.5	4.3	2.6
Diabetes Mellitus	1.2	4.3	1.4
Diseases of the Digestive System	1.4	0	2.2
Diseases of the Respiratory System	1.0	0	2.8
Congenital Anomalies	0.7	-	1.2
Infective and Parasitic Diseases	0.4	-	0.6
Diseases of the Blood and Blood-forming Organs	0.2	-	0.6
All Other Diseases	1.0	0	2.2
Total Annual Physical Evaluation Board Rate	29.4	27.3	52.9
Mean Population at Risk	60,049	557	4,008

[a]Annual rates are per 10,000 strength. Rates were not computed for diagnoses with frequencies less than three. Caution should be exercised in interpreting the rates among blacks because of the small number of cases (a total of 19).

neuroses and displacement of intervertebral disc. Male Caucasian officers had the highest rates for circulatory diseases (primarily cardiovascular disease) whereas the major reasons for blacks' board actions included schizophrenia and diabetes mellitus. Because of the small number of board actions among blacks, their rates should be interpreted with considerable caution.

The majority of officers who appeared before a Physical Evaluation Board were recommended to have their cases presented before a Physical Disability Review Board, the body that determines whether or not disability should be granted. After dichotomizing disability awards above or below 50%, the percentage distribution of disability awards of 50% or greater was 24.6% for male Caucasians, 17.5% for women, and 13.4% for blacks.

During the 12.5-year span of this study, the percentages of officers who were separated with an honorable discharge or released from active duty, as contrasted with a retirement from active duty, also differed significantly. The vast majority of each group were separated either with an honorable discharge or a release

from active duty, thereby indicating that most officers did not remain in the Navy to retire after a full career term. The percentages of separations totaled 69.5% for male Caucasians, 82.2% for women, and 85.5% for male blacks while the percentages of individuals who retired from the Navy included 20.3% for Caucasians, 14.4% for women, and 6.0% for blacks. The remaining percentages primarily consisted of reserve commissions as well as very low proportions of deaths and losses "under conditions other than honorable."

DISCUSSION

In studies designed to examine the racial or sex differential in illness and disability rates (c.f., Marcus and Seeman, 1981), the reported data typically are obtained during interviews which by their nature depend on interviewees' memories, their tendency to engage in denial, or their propensity to exaggerate the seriousness of an illness. In addition to interview behavior, other variables postulated as contributing to differences in rates include age, socioeconomic status, educational level, and employment record, although Marcus and Seeman (1981) report no differences on scores of health status indicators of illness and disability after adjusting for age, race, socioeconomic status, etc. The Navy Officer Corps data analyzed for this study reflect considerable homogeneity in terms of these characteristics: the hospitalization rates are not based on self-report information but instead are compiled from hospital records of illness and injuries; the age range of this population is quite narrow with relatively few individuals younger than 22 years or older than 45; the socioeconomic status of most officers centers on the middle class level (Janowitz and Moskos, 1979); few individuals have less than a college education, and all of the participants are employed. Because of the built-in control afforded by studying an officer population, the rate differentials reported herein might represent real differences in rates between minorities and dominants.

Results of this study identified several specific health problems unique to each of the selected minority groups in the Navy Officer Corps. In order to understand the differences in hospitalization rates between minority and dominant groups, several factors, such as genetic predisposition, biology, occupation, and availability of free health care, are examined as explanations for the higher rates observed. In comparing rates between minorities and dominants for those illnesses labeled as stress related, however, the findings are less clear-cut in that both racial groups as well as both sexes have high rates for one or more of the stress-related disorders. This differential susceptibility makes it difficult to attribute the influence of stress associated with being a minority to the incidence of all such conditions.

One of the most significant health problems differentiating black officers from Caucasians is the subcategory of hereditary hemolytic anemias and hemoglobinopathies, a finding that clearly implicates genetic predisposition as the contributing factor in the incidence of such diseases. Black officers also have significantly higher hospitalization rates than Caucasians for diabetes mellitus and hypertension, both of which are known to have a strong genetic component among blacks (Alderman and Schoenbaum, 1976). Job-related stress also has been shown to play a part in the prevalence of these two diseases, according to Cobb and Rose (1973) in their well-known study of air traffic controllers' health status. Another category of disorders with a significantly higher hospitalization rate for blacks than Caucasians is that of psychoses; as would be expected, black officers have a higher rate of medical separations for these same reasons. In explaining blacks' higher risk for psychoses, other researchers have identified both genetics and occupational stress as factors associated with the incidence of mental ill health (Rosenthal, 1970; Cooper and Marshall, 1976). Higher hospitalization rates for psychoses, diabetes mellitus, and hypertension also are reported for Navy

enlisted blacks (Hoiberg et al., 1981). The results of that study and the present effort seem to lend corroborative support for the hypotheses that genetic predisposition and job-related stress have an impact on the incidence of these disorders. Also to be considered as a facet of occupational stress is the social stressor of being a member of a minority group which might account for at least a small proportion of the elevated risk among blacks for these three disorders.

Hospitalization rates for the other stress-related disorders, however, are not significantly higher for black officers than for Caucasians. In particular, it should be noted that for those disorders postulated to be attributable primarily to stress (with no genetic base), such as transient situational disturbances, abdominal and gastrointestinal symptoms, and ulcers, the differences between the two racial groups are non-significant. These results clearly indicate that the impact of minority status alone cannot be considered a major or sole contributing factor in the incidence of stress-related disease among black officers.

Black officers also are observed as having significantly higher hospitalization rates than Caucasians for redundant prepuce and phimosis and strains, sprains, and dislocations. Factors associated with these results include availability of free health care for the former diagnosis and occupational risks and life style considerations for the latter subcategory.

For the occupational comparisons of hospitalization rates by sex, women in each of the three occupational groups have significantly higher rates than their male counterparts for genitourinary diseases; also noted is the sizable proportion of women's total rate for pregnancy-related conditions (21.4%, 20.1%, and 9.4%, respectively, across the three groups in Table 2). They also have much higher rates than men for the supplementary classifications category, which includes medical exams, medical or surgical aftercare, and prenatal care. Another significantly higher rate for women than men is their elevated rate for the category of neoplasms; women's reproductive system, including the breast, accounts for more than 75% of the hospitalizations recorded for this category. Moreover, one of women's highest medical separation rates is for breast cancer. From these findings, it can be concluded that the difference between men's and women's hospitalization rates is attributable in large part to pregnancy-related conditions and disorders unique to women's complex reproductive system. If rates for these conditions are subtracted from women's totals, the overall relative risks for women compared to men then are lowered to 1.7 for unrestricted line officers and 1.2 for Staff Corps while the relative risk for nurses becomes 1.7 with men having an even higher total hospitalization rate than women. Of the factors identified at the outset, biological differences between men and women account for this large portion of the sex differential in hospitalization rates.

Results of specific occupational comparisons show that both male and female nurses have significantly higher hospitalization rates than unrestricted line and Staff Corps officers. Similarly, Hoiberg (1980) has reported that Navy enlisted health care providers have much higher hospitalization rates than other enlisted occupations. The high rates for both enlistees and nurses suggest that individuals who are in health care delivery occupations perhaps are drawn to their profession because they are not as healthy as others or they have a greater predisposition for illness preoccupation. Other explanations for the higher health risks among nurses include: their work environment may be more stressful because of the urgency of responding to life and death situations which might contribute to a higher illness rate, physicians may be more inclined to admit nurses for inpatient care in an effort to maintain a high health status level among staff members, and the proximity to a medical inpatient facility would make a hospitalization much more convenient for nurses than

others. Further, their work setting no doubt represents an increased health risk for conditions associated with hazardous compounds such as disinfectants and for several disorders in the respiratory and infective and parasitic disease categories although nurses do develop an immunity to many infectious diseases.

In comparing rates between male and female nurses, significantly higher hospitalization rates are observed for male nurses than their female counterparts for the vast majority of diagnoses, but especially for digestive disorders (e.g., ulcers), respiratory diseases (e.g., pneumonias), infective and parasitic diseases, mental disorders, and circulatory diseases (e.g., hypertension). The most plausible explanation for the difference in respiratory and infective disease rates is that male nurses may serve at locations where there is a greater exposure to contagious disease than is the case for female nurses; Waldron and Johnson (1976) provide another reason by suggesting that men may have less resistance to infectious diseases than women. The difference in rates for pneumonias and the other diagnoses seems to be related to the widely reported findings that men are observed to have higher rates than women for accidental injuries and chronic and serious conditions whereas women typically have higher rates for acute disorders (Verbrugge, 1976). Other results show that of the 11 stress-related disorders only the differences between male and female nurses are statistically significant for the subcategories of ulcers and hypertension. Thus, similar to the interpretation of the results obtained for black officers, it would be inaccurate to conclude that male nurses suffer an elevated rate of stress-related disease because of their minority status, although this factor might play a role in the incidence of the two disorders found to differentiate male from female nurses. Men's greater risk of chronic disease, or women's greater resistance to chronic disease, probably is a more plausible explanation for the sex differential in these rates. Also supportive of men's greater likelihood than women of suffering a chronic disease, particularly in such a relatively young population as the Navy Officer Corps, is the finding that men in each of the three occupational groups have significantly higher rates than women for the category of circulatory diseases, which includes the chronic conditions of hypertension and cardiovascular disease.

Women unrestricted line officers, on the other hand, have significantly higher hospitalization rates than men for almost all major diagnostic categories as well as the stress-related disorders of neuroses, abdominal and gastrointestinal symptoms, diarrheal disease, and transient situational disturbances. Several background factors should be considered in explaining these differences. First, annual hospitalization rates for male unrestricted line officers are extremely low; their rates tend to be lower than those reported for other male officers—and considerably lower than rates observed in the civilian community (Hoiberg and Blood, 1983). Second, women unrestricted line officers' rates for almost all diagnoses are lower than those for women nurses with the exception of their fairly comparable rates for mental disorders. According to the explanations just noted, however, hospitalization rates typically are higher for health care providers than other occupational groups. Thus, on the basis of the cited results, women's rates for this occupational group would be expected to be higher than their male counterparts and lower than nurses. The relatively high rates of stress-related hospitalizations, which do not differ significantly from nurses' rates, suggest tht women unrestricted line officers might be experiencing some adjustment difficulties associated with their occupation. Also to be considered as a potential stressor is the fact that being an unrestricted line officer is the most nontraditional career for women of the three general occupational categories studied in this research. For women Staff Corps officers, rates for neuroses, diabetes mellitus, and transient situational disturbances also

are significantly higher than those for men. Such results, especially those for unrestricted line officers, provide some evidence in support of the hypothesis that the impact of being a minority member is reflected by an increased rate of stress-related hospitalizations.

With regard to Physical Evaluation Board actions, comparisons reveal that women and blacks have the highest rates for mental disorders (i.e., stress-related disorders) while Caucasians have relatively low rates for these diagnoses. For rates of longevity, Caucasians have the highest proportion of officers who retired from active duty after 20 years (20.3%) as contrasted with the lower rates for women (14.4%) and blacks (6.0%). Such results indicate that the dominant group seems to fare better in terms of physical, mental, and career longevity than the minority groups.

The importance of these results are as follows. (1) The Navy's medical department should be apprised of the health care needs unique to each miniorty group in the organization. (2) Each minority group studied is shown to have significantly higher rates than dominants for one or more of the stress-related disorders, with women unrestricted line officers having more significant differences than other groups. Perhaps an increment in the proportion of women in unrestricted line officer positions would result in a lowering of stress-related illness rates; an increase in the number of enlisted women is reported to correspond with a decrease in such conditions (Hoiberg, 1984). (3) Dominants, in this case male Caucasian officers in each of the three occupational groups, have significantly higher rates of circulatory disease than women. Prevention and intervention programs should be implemented in an effort to reduce the incidence of chronic disease among male Navy officers. (4) These findings point to the need to conduct correlational analyses to determine the extent of the relationship between minority status and illness behavior. Results of the present effort and subsequent studies on the association between illness and minority status should pave the way toward further enhancement of the physical and mental well-being of all Navy personnel.

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The purpose of this study was (1) to identify the health risks unique to various minority groups in the U.S. Navy Officer Corps, (2) to determine whether or not being a minority member had an impact on health, and (3) to examine differences in overall effectiveness rates between minority and dominant groups. Results showed that black male officers had significantly higher hospitalization rates than Caucasians for six specific disorders; male nurses had significantly higher hospitalization rates than female nurses and the highest rates across three

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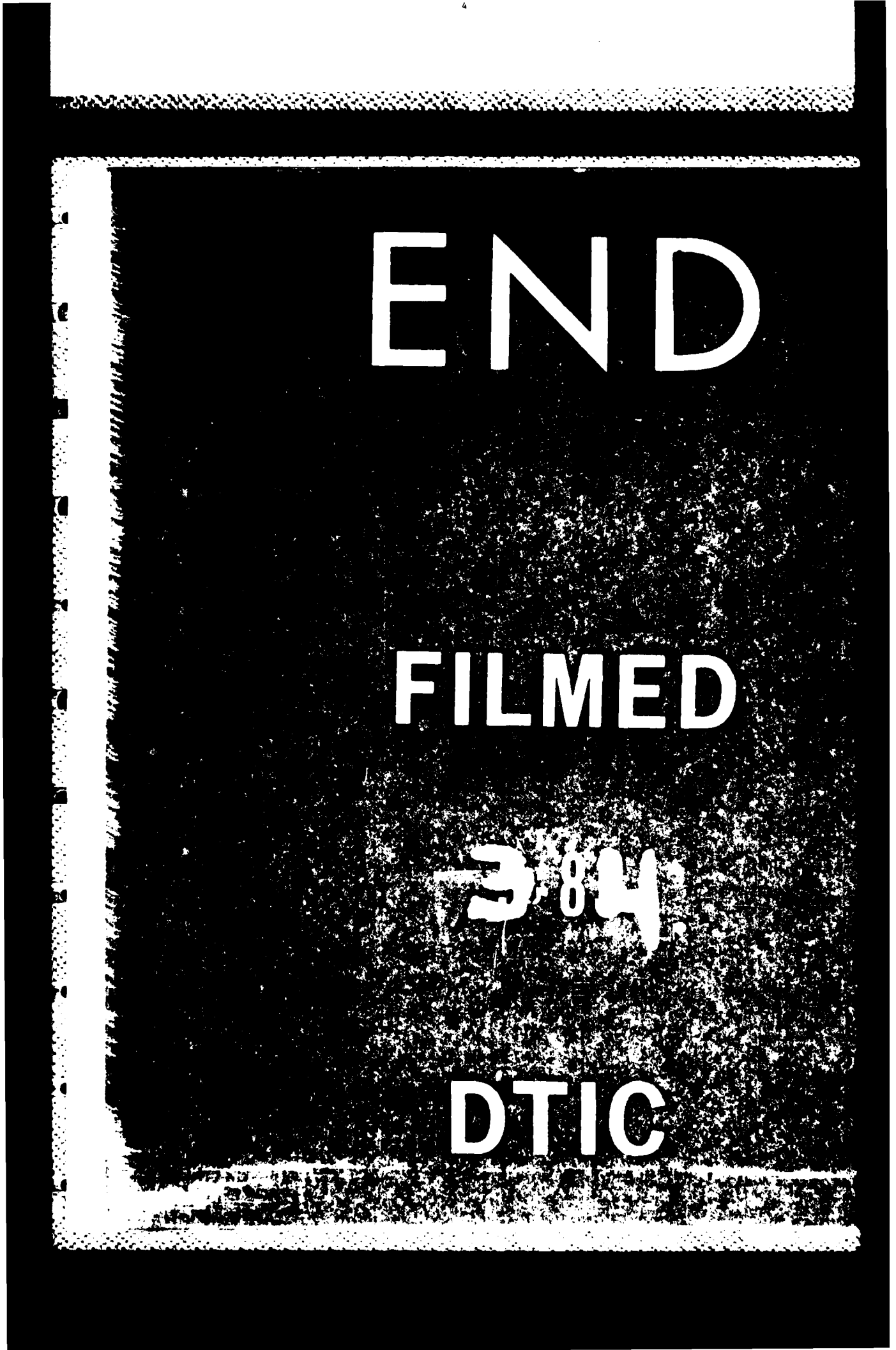
occupational groups; women unrestricted line officers had significantly higher rates for several stress-related disorders than their male counterparts; men in each of the three groups had higher rates than women for circulatory disorders whereas women's rates for pregnancy-related conditions and genitourinary disorders represented a large proportion of the sex differential in rates; and male Caucasians seemed to fare better in terms of health status and career longevity than blacks or women. Several recommendations were presented.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